

WELCOME

Global / International Issues Session:

Expanding the Dialogue on Inventory Harmony and Best Practices

Co-Chairs Vance Wagner & Paulette Middleton

Session Goals

Provide participants with a

- Concrete view of specific emissions inventory developments in regions outside the USA and
- Sense for international harmonization and global inventory efforts.

Discussion Topics

- Emissions inventory software models being adapted and/or used internationally
- Current international efforts aimed at harmonizing emissions inventories
- Key steps for countries in the early stages of inventory development
- Proxy data being used by countries and regions when data is unavailable
- International best practice data quality assurance programs
- Emissions information transfer between United States and developing countries
- Future United States improvements that reflect international programs



Global Emissions Inventory Activity

<http://www.geiacenter.org/>

Enhancing Communications on Global Emissions 2009

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OUTLINE

- **GEIA and Links to Other Global Programs**
- **Recent contributions and next steps**
- **Current activities spotlighting harmonization**
- **Communication bridges and YOU**



*Brings together **people**, **data** and **tools** to create
Highest quality information on global exchange processes.*

MISSION

- ✧ Quantify the anthropogenic emissions and natural exchanges of trace gases and aerosols that drive earth system changes and
- ✧ Facilitate use of this information by the research, assessment and policy communities.

GEIA is an integrating project of the
AIMES (Analysis, Integration and Modeling of the Earth System) of the
IGBP (International Geosphere-Biosphere Program).
GEIA efforts are closely linked with
ACCENT (Atmospheric Composition Change A European NeTworknetwork).



IGBP GOALS:

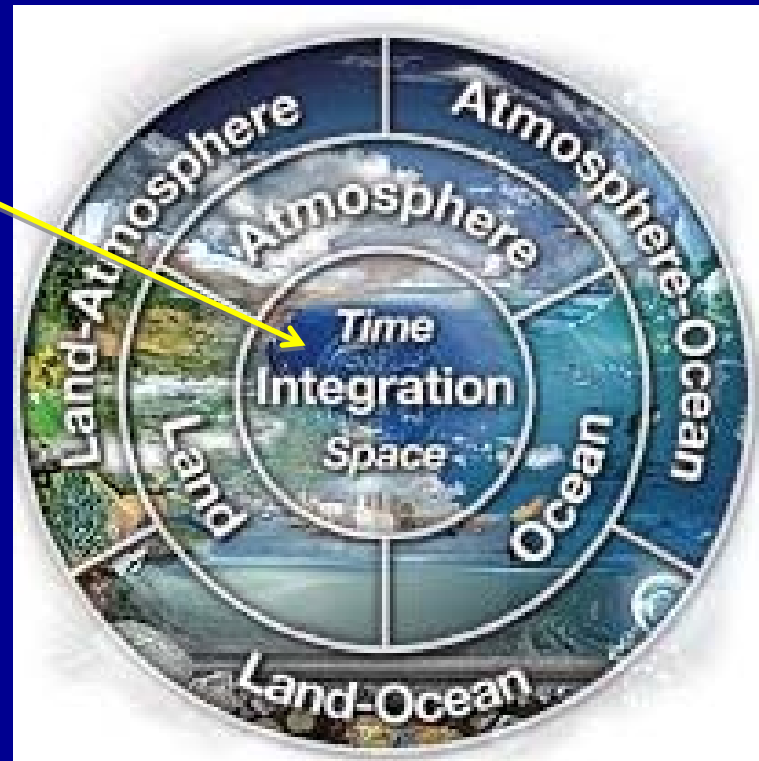
Analyze interactive physical, chemical and biological processes
that define Earth System dynamics,
the changes that are occurring in these dynamics, and
the role of human activities on these changes.

AIMES

Overarching Goal:

Understand and quantify the
Influence of human choice on
Environmental change and the many
Subsequent feedbacks and linkages between
Human activities and the natural environment.

IGBP PROJECTS



ACCENT

GOALS

- Promote a common European strategy for research on *atmospheric composition sustainability*,
- Develop and maintain durable means of communication and collaboration within the European scientific community, and
- Facilitate this research and to optimise the interactions with policy-makers and the general public.



*Links continue to grow.
Working together improves our assessments.*



OUTLINE

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GEIA Leadership & Advisors

GEIA Co-Chairs

- Claire Granier (NOAA, USA; CIRES-CU, USA; UPMC and CRS, France)
- Alex Guenther (NCAR, USA)

GEIA Steering Committee

- ❖ Paulette Middleton (Panorama Pathways, USA)
- ❖ Jean-François Lamarque (CSD/ERSL/NOAA and NCAR, USA)
- ❖ Hajime Akimoto (JAMSTEC, Japan)
- ❖ Frank Denterner (Joint Research Center, Italy)
- ❖ Laurens Ganzeveld (Univ. of Wageningen, The Netherlands)
- ❖ Zbigniew Klimont (IISAS, Austria)
- ❖ John VanAardenne (Joint Research Center, Italy)

ACCENT-Emissions Steering Committee

- ✧ Klaus Butterbach-Bahl (IMK-IFU, Germany)
- ✧ Ivar Isaksen (University of Oslo, Norway)
- ✧ Aude Mieville (LATMOS/IPSL, France)
- ✧ Jean-François Mueller (IASB-BIRA, Belgium)
- ✧ Jos Olivier (MNP, The Netherlands)
- ✧ Claire Reeves (University of East Anglia, UK)
- ✧ Vigdis Vestreng (Norwegian Pollution Control Authority, Norway)

GEIA Web Site

<http://www.geiacenter.org/>

Home Page

GEIA
Global Emissions Inventory Activity



[Learn About GEIA](#)

[Get Workshop News](#)

[Take GEIA Questionnaire](#)

[Join GEIA Network](#)

[Contact GEIA](#)

GEIA

-- an integrating project of
AIMES/International Geosphere-Biosphere Program --

*Brings together people, data and tools to create highest quality
information on global exchange processes.*

GEIA is managed by the GEIA Steering Committee and supported internationally.

New Data Information
Population, Ecosystems, Fire, Land-Use Change, ...
ECCAD: emissions data and ancillary data for emissions calculation

Recent Reports
Key Issues Related to Atmospheric Composition Changes

Upcoming Events
Integrated Land Ecosystem-Atmosphere Processes Study, iLEAPS
Science Conference August 24-28, 2009

GEIA Portal
now at <http://www.aero.jussieu.fr/projet/ACCENT/database.php>
Please send your questions and suggestions to the **GEIA Forum**.

GEIA Home

PRODUCTS

- GEIA Portal
- GEIA v.1
(Original Inventories)
- Emission Reviews
- Catalogue: Key Links

COORDINATION


- GEIA News
- GEIA Forum
- GEIA Network
- Workshops & Reports
- Outreach Materials

**Communication channel for global emissions activities –
Products (e.g., data, information, reviews,) &
Coordination (network – over 800 currently, conferences, reports, ...)**

GEIA / ACCENT Portal

<http://www.aero.jussieu.fr/projet/ACCENT/database.php>


Home Page



ACCENT
ATMOSPHERIC COMPOSITION CHANGE
THE EUROPEAN NETWORK OF EXCELLENCE

GEIA/ACCENT Emissions

A cooperative effort



Home

Project description

Emission Data portal

Data manipulation tools

Workshops & meetings

Contacts

Web links

ACCENT web portal

GEIA project

Other Web links

GEIA/ACCENT Emission Data Portal

|| *This web site is designed for Mozilla, Firefox or Netscape browsers*

|| *When using any data from the GEIA/ACCENT web portal, we request that you acknowledge the authors of the datasets of each inventory, as well as the GEIA/ACCENT database activity (see Project description)*

The **GEIA /ACCENT** data portal provides surface emissions data (total and gridded data), for the main emission categories (total anthropogenic, total biomass burning, biogenic, and oceans) at global or regional scales, from several inventories (RETRO, POET, EDGARFT2000, GFEDv2, GEIA v1,...).

You can access the data through the 'INVENTORIES TABLE':

- **INVENTORIES TABLE**

You can also have the List of species for each inventory :

- **LIST of SPECIES**

Links to other Emission Inventories / Databases

- **EMEP** -- Norwegian Meteorological Institute -
- **EDGAR** -- MNP -
- **Aerocom** -- LSCE(CNRS) / MPI-Met -
- **IIASA** -- International Institute for Applied Systems Analysis (IIASA) -

***GEIA work: Make inventories more easily available.
Facilitate comparisons and evaluations.***

GEIA-ACCENT Current On-site Data

Global Inventories

Inventory	Categories	Spatial resolution	Temporal resolution	Period	Home site (for detailed or sectorized data)
POET	anthropogenic biomass burning natural	1° x 1°	annual (anthro) monthly (biom. burn.) monthly (nat.)	1990 -2000 period	=>
RETRO	anthropogenic biomass burning	0.5° x 0.5°	monthly	1960 -2000 period	=>
EDGAR 3.2FT2000	anthropogenic biomass burning	1° x 1°	annual	2000	=>
GFED v2	biomass burning	1° x 1°	monthly 8 day (available on GFED home site)	1997 - 2005	=>
GICC-bb	biomass burning	1° x 1°	monthly	1997 - 2005	-
CO2 Andres et al.	anthropogenic	1° x 1°	annual	1751 - 2003	no
GEIA v.1	anthropogenic biomass burning natural	1° x 1°	annual + monthly for NOx, SO2, and nat.VOC	depends on the compound	=>
AMAP -Mercury	anthropogenic	0.5° x 0.5°	annual	1995 and 2000	=>

Regional Inventories

Inventory	Categories	Spatial resolution	Temporal resolution	Period	Home site (for detailed or sectorized data)
REAS - Asia	anthropogenic	0.5° x 0.5°	1 year	1980-2020	=>
EMEP - Europe	anthropogenic	0.5° x 0.5°	1 year	1970-2020	=>
ABBI - Asia	biomass burning	1° x 1°	1 day	March to May 2000 - March to May 2001	-

Remark:

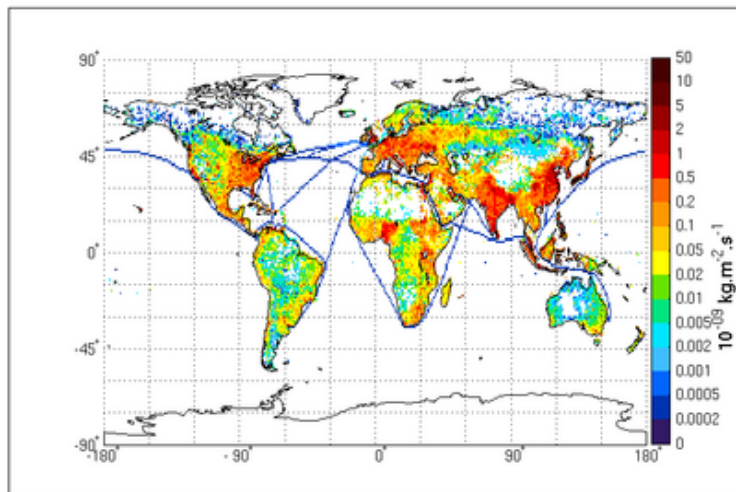
- anthropogenic : fossil fuel use + biofuel use + industry + agriculture waste burning
- biomass burning : fires from wild lands (forest fires + savannah fires)
- natural : vegetation and oceans emissions

ACCENT EMISSION PROJECT INTERFACE ----- developed/hosted by IPSL/LSCE

UPDATE - Synchron 4-Images links -> presently on dataipsl accent interface

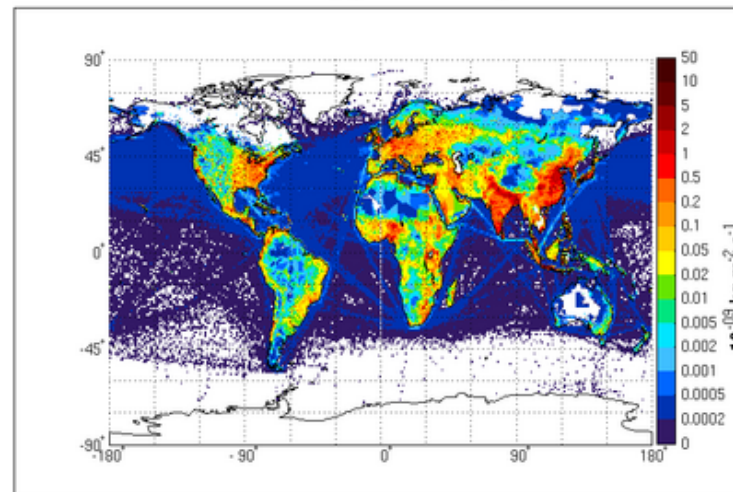
Graph Data source Species Parameter
MAP ▾ EDGAR ▾ CO ▾ EMIanthro ▾
WORLD ▾ 2000 ▾ ALLYEAR ▾

EDGAR - Total anthrop. co emission flux - year 2000, month 1



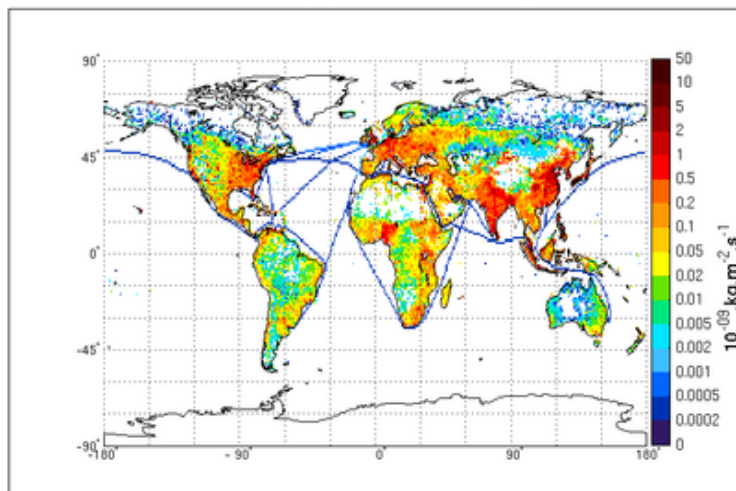
Graph Data source Species Parameter
MAP ▾ RETRO ▾ CO ▾ EMIanthro ▾
WORLD ▾ 2000 ▾ ALLYEAR ▾

RETRO - CO anthropogenic emission flux - year 2000



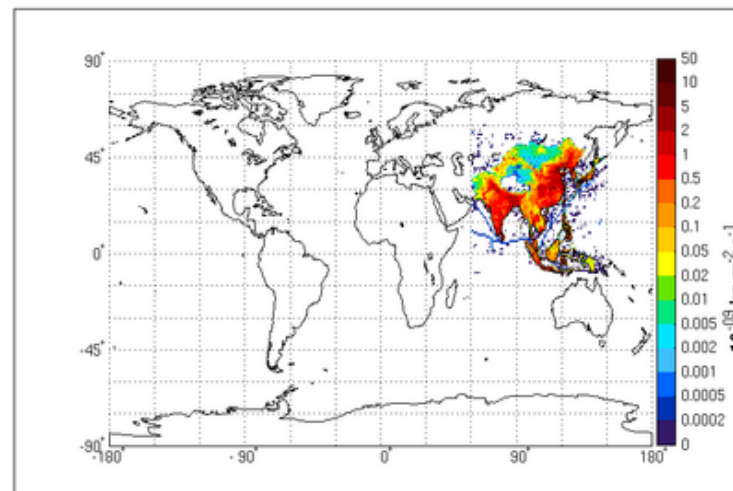
Graph Data source Species Parameter
MAP ▾ POET ▾ CO ▾ EMIanthro ▾
WORLD ▾ 2000 ▾ ALLYEAR ▾

POET - CO anthropogenic emission flux - year 2000



Graph Data source Species Parameter
MAP ▾ REAS ▾ CO ▾ EMIanthro ▾
WORLD ▾ 2000 ▾ ALLYEAR ▾

REAS - Asia CO anthropogenic emissions - year 2000



Visualization
Tool
Example:
Comparison
of 4 datasets
providing
CO emissions
for 2000

Many Inventory Efforts Worldwide: Here are a few examples.

- ✓ Projects/Programs Focused on earth system exchange processes and anthropogenic emissions
- ✓ Global Emissions Data Portals Web sites that provide access to multiple data sets
- ✓ Emissions Data-Multiple Chemicals--Global Coverage Multiple chemical data sets with global coverage
- ✓ Emissions Data-Single Chemicals--Global Coverage Single chemical data sets with global coverage
- ✓ Emissions Data - Regional Coverage Multiple chemical data sets with regional coverage

Many data sets and/or links to them are available through GEIA.
Continually evolving. Let us know about your work.

Overarching Challenges

Do data bases provide the same information in time & space?

How easy is it to combine data bases for doing assessments in desired period & domain?

Are the data bases comprehensive enough to address issues at hand?

What do you think are the best ways to exchange timely information on progress?



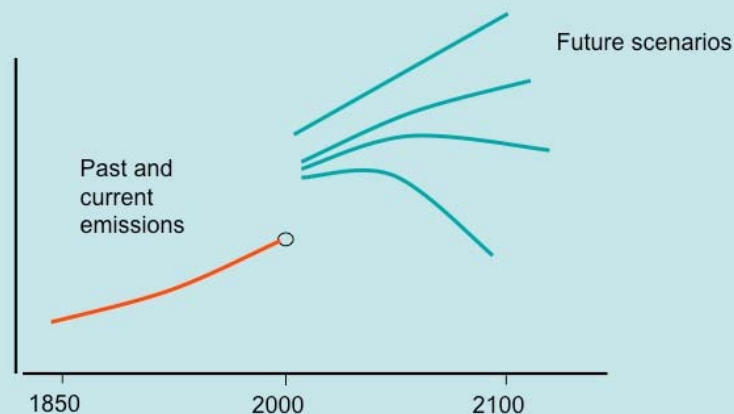
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- **Current activities spotlighting harmonization**
- Communication bridges and YOU

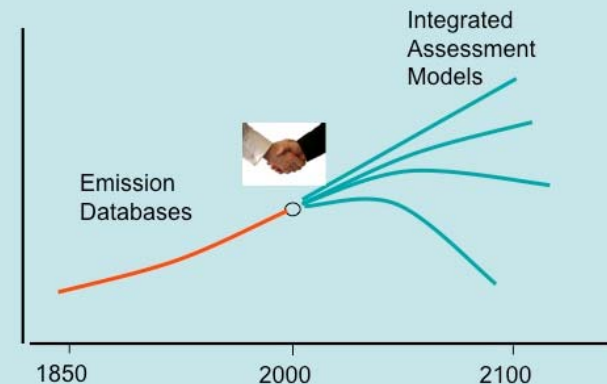
Example of Harmonizing Emissions for Global Assessments*

Emissions for the next IPCC Assessment Report

Emissions IPCC AR4



IPCC AR5: The Handshake Process



Data will be used for simulations done over the 1850 – 2100 period.

GENERAL APPROACH 2000 is the anchor year. Regional data used when possible

Choose “best” data set for each chemical for each sector for data up to 2000.

Chemicals Greenhouse gases: (CH₄ on grid; N₂O, HFCs, PFCs, CFCs, SF₆ as global sum),

Aerosols: SO₂, BC, OC (on grid), **Active gases:** CO, NO_x, NMVOC, NH₃ (on grid)

Sectors Shipping, aviation, land transport, energy, solvents, waste, residential, industrial processes, agricultural waste burning, animals, savanna waste burning, deforestation, and natural emissions.

*Work in Progress: Past and Future non-CO₂ Emissions for IPCC AR5– Granier et al

Main Challenges Noted.....

*Underscore need for more data set transparency,
easy-to-implement intercomparison strategies, and
consistent inventory development guidelines.*

- ◆ No global inventory currently available for years after 2000
- ◆ All available inventories give very different data (total for the different regions, location of maximum emissions, etc). Nobody knows which one is the best. This is the case for CO, CO₂, CH₄, NO_x, VOCs, etc.
- ◆ Long-term variation of inventories (over several decades) was not consistent: some emissions were increasing in some inventories and some were decreasing at the same time.
- ◆ Emissions from global and regional inventories are not consistent: large differences in totals for the same areas.
- ◆ No data on VOC speciation in most regions.
Generally, data available for a few EU countries are applied to the whole world.
- ◆ Difficult to compare aerosols at the global and regional scale: regional data give PMs; global give BC and OC.

Details to appear in the next IGAC Newsletter at <http://www.igac.noaa.gov/newsletter/>

Assessing Issues & Information Needs from Different Perspectives: North America Example

Information Needs for Addressing Air Quality Issues at Multiple Management Levels

Issues	Inventory	Monitoring	National Priority	Cross-Border Concerns	Short- and Long-Range Transport	Climate Change	Multi-Pollutant Strategies	Climate Change - Air Quality Assessments
Urban Air Quality	SO ₂ , NO _x , NH ₃ , CO, Pb, Speciated VOC & PM _{2.5} , PM	O ₃ , SO ₂ , NO _x , NH ₃ , CO, Pb, Speciated VOC & PM _{2.5} , PM, NO _y	Individual Countries (US, CA, MX) Addressing Issue at National Level	Border countries involved. Could be addressing one or more of the issues	Two or more countries involved. Could be addressing one or more of the issues.		Individual or multi-country strategies which may impact one or more of the issues	Individual or multi-country assessment which consider all of the issues
Rural Air Quality	SO ₂ , NO _x , NH ₃ , CO, Speciated VOC & PM _{2.5} , PM, CH ₄	O ₃ , SO ₂ , NO _x , NH ₃ , CO, Speciated VOC & PM _{2.5} , PM, NO _y	Individual Countries (US, CA) Addressing Issue at National Level	"			"	"
Toxics	Mainly HAPs + other Rural AQ emissions for chemistry	Toxic VOCs & PM Species (e.g., mercury)	"	"	"		"	"
Acid Dep, Excess N Dep	Mainly SO ₂ , NO _x , NH ₃ + other Rural AQ emissions for chemistry	Speciated Wet & Dry Deposition	"	"	"		"	"
Mercury	Speciated Mercury + Rural AQ emissions for chemistry	Speciated Mercury Deposition	"	"	"		"	"
Visibility	Rural AQ Emissions	Light Extinction, visual indices	"	"	"		"	"
Climate Change	CO ₂ , CH ₄ , N ₂ O, CFC's, O ₃ Precursors, Aerosols, etc	CO ₂ , CH ₄ , N ₂ O, Aerosols, O ₃	Individual Countries (US, CA, MX) Addressing Issue at National Level	"	"	Multiple countries involved	"	"

Note that " means that the information is the same as for the box above.

US-United States, CA-Canada, MX-Mexico

Prepared for Commission on Environmental Cooperation - Assessment of North American Emissions Inventories and Monitoring Networks

To appear at <http://www.cec.org/home/index.cfm?varlan=english>

Complex, comprehensive, harmonized inventories desired for addressing multiple interconnected issues from broad management perspectives. Working together, capacity building, and leveraging resources are key elements for success.



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What are YOUR biggest emission challenges?

What information is most valuable to YOU?

What communication avenues do YOU prefer?

Activities & Opportunities 2009

Update/upgrade Information (Web sites, Network, ...)

Contribute to International Assessments (IPCC, HTAP, AC&C, ...)

Promote Advances in Global Emissions (GEIA Conference, other workshops,...)

Develop Collaborative Research Programs (GEIA-iLEAPS-IGAC, ...)

Contribute to Understanding Completeness and Compatibility of Data Bases (CEC, ...)

Enhance dialogues among researchers and data users (Wiki-based system, E-networks, ...)

Enhance availability of emissions information (Expand GEIA Catalogue, ...)

Contribute to documentation of state-of-science on emissions (GEIA Emissions Reviews, ...)

We look forward to hearing more from YOU
During the panel discussions
And in the days to come.

Questions

Comments

Contact me

paulette@panoramapathways.net

THANKS !!!!!!!

